TABLE 2

CRY3BB* PROTEINS EXHIBITING IMPROVED ACTIVITY AGAINST SCRW LARVAE

Cry3Bb* Protein Designation	*cry3Bb** Plasmid Designation	*cry3Bb** Nucleotide Sequence Changes	Cry3Bb* Amino Acid Changes	Structural Site of Changes	Fold Increase Over WT Activity	Design Method Used
Cry3Bb.60	–	–	Δ1-159	Δα1-α3	3.6×	1, 6, 8
Cry3Bb.11221	pEG1707	A460T,C461T, A462T, C464A, T465C, T466C, T467A, A468T, A469T, G470C, T472C, T473G, G474T, A477T, A478T, G479C	T154F, P155H, L156H, L158R	lα3,4	6.4×	1, 8
Cry3Bb.11222	pEG1708	T687C, T688C, A689T, C691A, A692G	Y230L,H231S	α6	4.0×	3, 7
Cry3Bb.11223	pEG1709	T667C, T687C, T688A, A689G, C691A, A692G	S223P, Y230S	α6	2.8×	3
Cry3Bb.11224	pEG1710	T687C, A692G	H231R	α6	5.0×	7, 8
Cry3Bb.11225	pEG1711	T687C, C691A	H231N, T241S	α6	3.6×	7
Cry3Bb.11226	pEG1712	T687C, C691A, A692C, T693C	H231T	α6	3.0×	7, 8
Cry3Bb.11227	pEG1713	C868A, G869A, G870T	R290N	lα7,β1	1.9×	2, 3, 4 6
Cry3Bb.11228	pEG1714	C932T, A938C, T942G, G949A, T954C	S311L, N313T, E317K	lβ1,α8	4.1×	2, 4

Cry3Bb* Protein Designation	*cry3Bb** Plasmid Designation	*cry3Bb** Nucleotide Sequence Changes	Cry3Bb* Amino Acid Changes	Structural Site of Changes	Fold Increase Over WT Activity	Design Method Used
Cry3Bb.11229	pEG1715	T931A, A933C, T942A, T945A, G949A, A953G, T954C	S311T, E317K, Y318C	lβ1,α8	2.5×	2, 4
Cry3Bb.11230	pEG1716	T931G, A933C, C934G, T945G, C946T, A947G, G951A, T954C	S311A, L312V, Q316W	lβ1,α8	4.7×	2, 4 8
Cry3Bb.11231	pEG1717	T687C, A692G, C932T, A938C, T942G, G949A, T954C	H231R, S311L, N313T, E317K	α6; lβ1,α8	7.9×	2, 4, 7, 8, 10
Cry3Bb.11232	pEG1718	T931A, A933G, T935C, T936A, A938C, T939C, T942C, T945A, G951T, T954C	S311T, L312P, N313T, E317N	lβ1,α8	5.1×	4
Cry3Bb.11233	pEG1719	T931G, A933C, T936G, T942C, C943T, T945A, C946G, G948C, T954C	S311A, Q316D	lβ1,α8	2.2×	2, 4
Cry3Bb.11234	pEG1720	T861C, T866C, C868A, T871C, T872G, A875T, T877A, C878G, A882G	I289T, L291R, Y292F, S293R	lα7,β1	4.1×	4
Cry3Bb.11235	pEG1721	T687C, A692G, C932T	H231R, S311L	α6; lβ1,α8	3.2×	2, 4, 7, 8, 10

Cry3Bb* Protein Designation	*cry3Bb** Plasmid Designation	*cry3Bb** Nucleotide Sequence Changes	Cry3Bb* Amino Acid Changes	Structural Site of Changes	Fold Increase Over WT Activity	Design Method Used
Cry3Bb.11236	pEG1722	T931A, C932T, A933C, T936C, T942G, T945A, T954C	S311I	lβ1,α8	3.1×	2, 4
Cry3Bb.11237	pEG1723	T931A, C932T, A933C, T936C, A937G, A938T, C941A, T942C, T945A, C946A, A947T, A950T, T954C	S311I, N313H	lβ1,α8	5.4×	2, 4
Cry3Bb.11238	pEG1724	A933C, T936C, A937G, A938T, C941A, T942C, T945A, C946A, A947T, A950T, T954C	N313V, T314N, Q316M, E317V	lβ1,α8	2.6×	2, 4
Cry3Bb.11239	pEG1725	A933T, A938G, T939G, T942A, T944C, T945A, A947T, G948T, A950C, T954C	N313R, L315P, Q316L, E317A	lβ1,α8	2.8×	2, 4
Cry3Bb.11241	pEG1726	A860T, T861C, G862A, C868T, G869T, T871C, A873T, T877A, C878G, A879T	Y287F, D288N, R290L	lα7,β1	2.6×	2, 3, 4, 6
Cry3Bb.11242	pEG1727	C868G, G869T	R290V	lα7,β1	2.5×	2, 3, 4, 6, 8

Cry3Bb* Protein Designation	*cry3Bb** Plasmid Designation	*cry3Bb** Nucleotide Sequence Changes	Cry3Bb* Amino Acid Changes	Structural Site of Changes	Fold Increase Over WT Activity	Design Method Used
Cry3Bb.11032	pEG1041	A494G	D165G	α4	3.1×	2, 4, 8
Cry3Bb.11035	pEG1046	G479A, A481C, A482C, A484C, G485A, A486C, A494G	S160N, K161P, ~~P~~R162H, D165G	α4	2.7×	8
Cry3Bb.11036	pEG1047	A865G, T877C	I289V, S293P	lα7,β1	4.3×	4
Cry3Bb.11046	pEG1052	G479A, A481C, A482C, A484C, G485A, A486C, A494G, A865G, T877C	S160N, K161P, ~~P~~R162H, D165G, I289V, S293P	α4; lα7,β1	2.6×	2, 4, 8, 10
Cry3Bb.11048	pEG1054	T309A, Δ310, Δ311, Δ312	D103E, ΔA104	lα2a,2b	4.3×	8
Cry3Bb.11051	pEG1057	A565G, A566G	K189G	lα4,5	3.0×	2, 3, 4
Cry3Bb.11057	pEG1062	T309A, Δ310, Δ311, Δ312, G479A, A481C, A482C, A484C, G485A, A486C, A494G	D103E, ΔA104, S160N, K161P, ~~P~~R162H, D165G	lα2a,2b; α4	3.4×	2, 4, 8, 10
Cry3Bb.11058	pEG1063	T309A, Δ310, Δ311, Δ312, A460T, C461T, A462T, C464A, T465C, T466C, T467A, A468T, A469T, G470C, T472C, T473G, G474T, A477T, A478T, G479C	D103E, ΔA104, T154F, P155H, L156H, L158R	lα2a,2b; lα3,4	3.5×	1, 8, 10

Cry3Bb* Protein Designation	*cry3Bb** Plasmid Designation	*cry3Bb** Nucleotide Sequence Changes	Cry3Bb* Amino Acid Changes	Structural Site of Changes	Fold Increase Over WT Activity	Design Method Used
Cry3Bb.11081	pEG1084	A494G, T931A, A933C, T942A, T945A, G949A, T954C	D165G, S311T, E317K	α4; lβ1,α8	6.1×	2, 4, 8, 10
Cry3Bb.11082	pEG1085	A494G, A865G, T877C, T914C, T931G, A933C, C934G, T945G, C946T, A947G, G951A, T954C, A1043G, T1094C	D165G, I289V, S293P, F305S, S311A, L312V, Q316W, Q348R, V365A	α4; lα7,β1; β1; lβ1,α8; β2; β3b	4.9×	2, 4, 5, 8, 9, 10
Cry3Bb.11083	pEG1086	A865G, T877C, A1043G	I289V, S293P, Q348R	lα7,β1; β2	7.4×	4, 5, 9, 10
Cry3Bb.11084	pEG1087	A494G, C932T	D165G, S311L	α4; lβ1,α8	7.2×	2, 4, 8, 10
Cry3Bb.11095	pEG1095	A1043G	Q348R	β2	4.6×	5, 9
Cry3Bb.11098	pEG1098	A494G, T687C, A692G, C932T, A938C, T942G, G949A, T954C	D165G, H231R, S311L, N313T, E317K	α4; α6, 1β1, α8	7.9×	2,4,7,8